FIG. 1

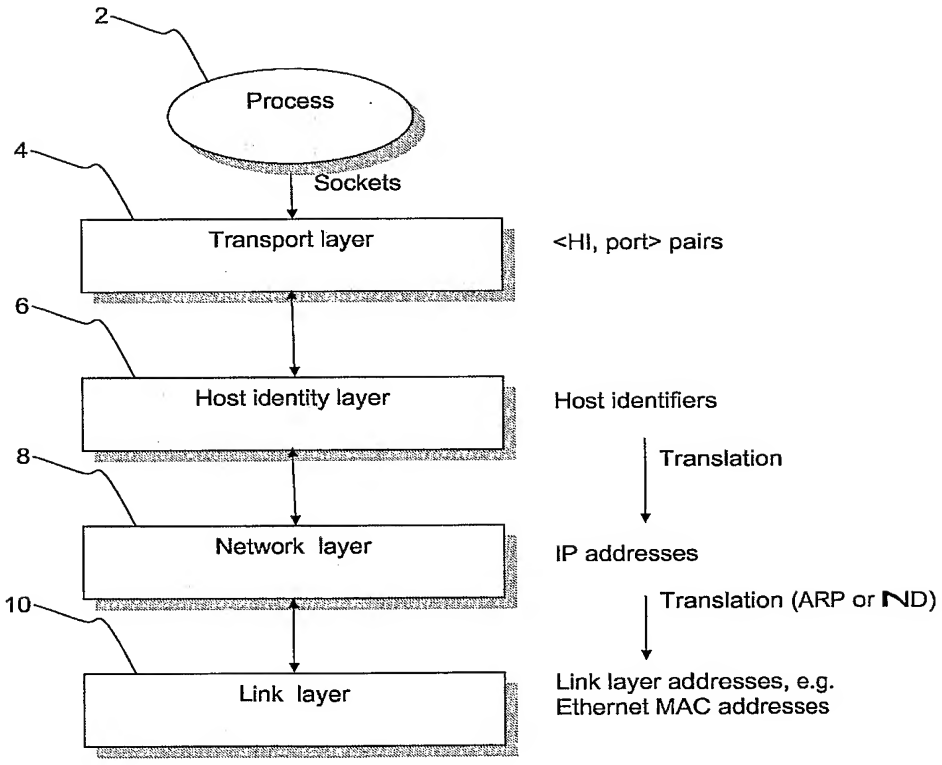

2
Process
4
Sockets
Transport layer
<HI, port> pairs
6
Host identity layer
Host identifiers
Translation
8
Network layer
IP addresses
Translation (ARP or ND)
10
Link layer
Link layer addresses, e.g.
Ethernet MAC addresses

FIG. 2

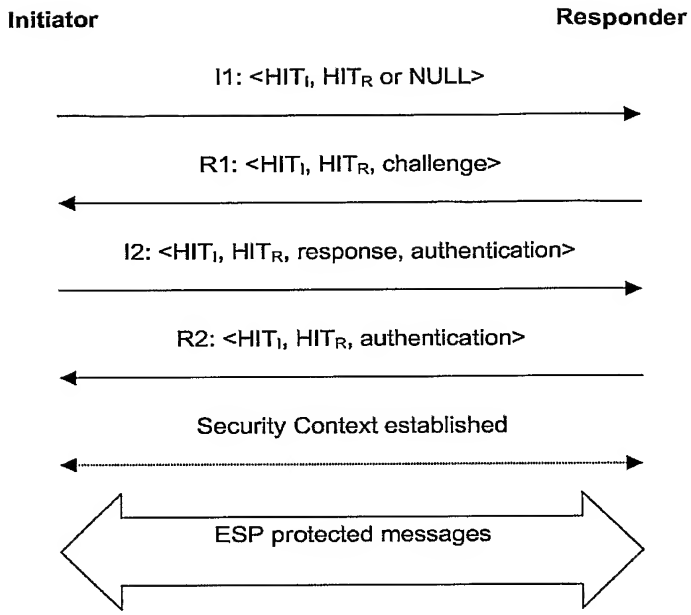

Initiator
Responder
I1: <HIT$_I$, HIT$_R$ or NULL>
R1: <HIT$_I$, HIT$_R$, challenge>
I2: <HIT$_I$, HIT$_R$, response, authentication>
R2: <HIT$_I$, HIT$_R$, authentication>
Security Context established
ESP protected messages

FIG. 3

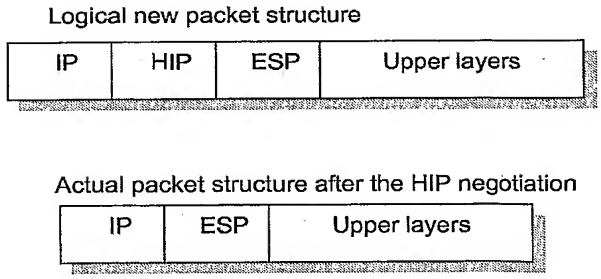

Logical new packet structure
IP
HIP
ESP
Upper layers
Actual packet structure after the HIP negotiation
IP
ESP
Upper layers

FIG. 4

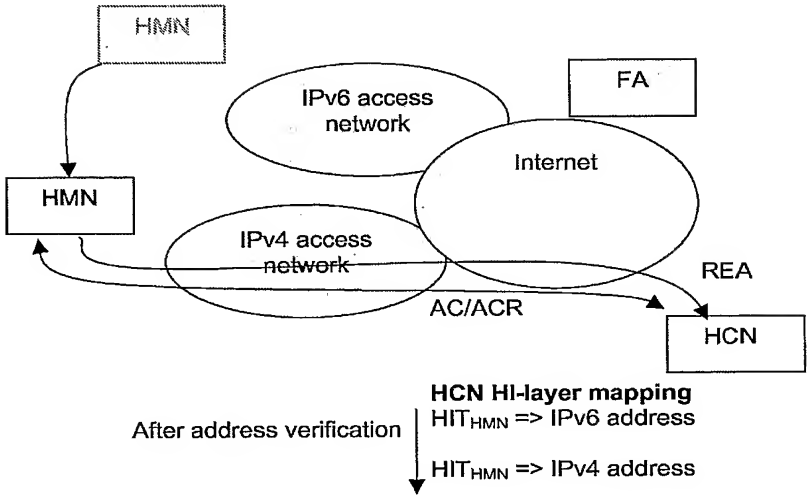

HMN
IPv6 access network
FA
Internet
HMN
IPv4 access network
REA
AC/ACR
HCN
HCN HI-layer mapping
After address verification
HIT$_{HMN}$ => IPv6 address
HIT$_{HMN}$ => IPv4 address

FIG. 5

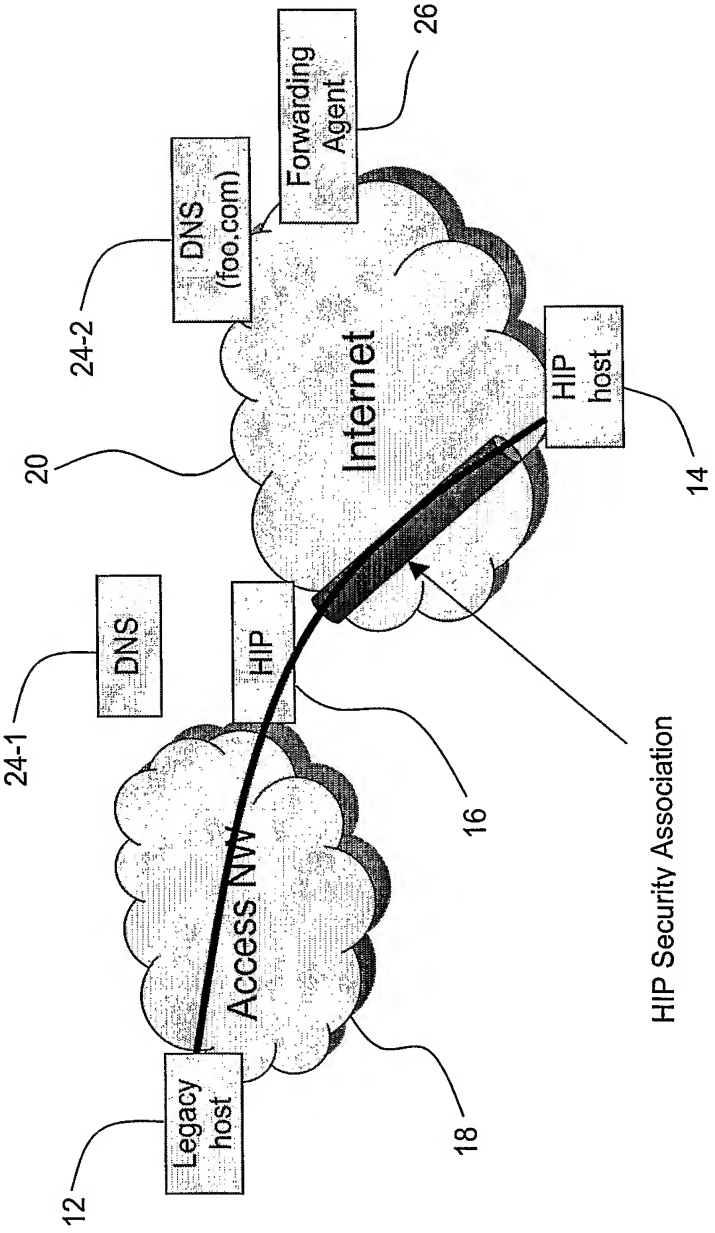

Forwarding Agent
26
DNS (foo.com)
24-2
Internet
20
HIP host
14
DNS
24-1
HIP
16
HIP Security Association
Access NW
18
Legacy host
12

FIG. 6

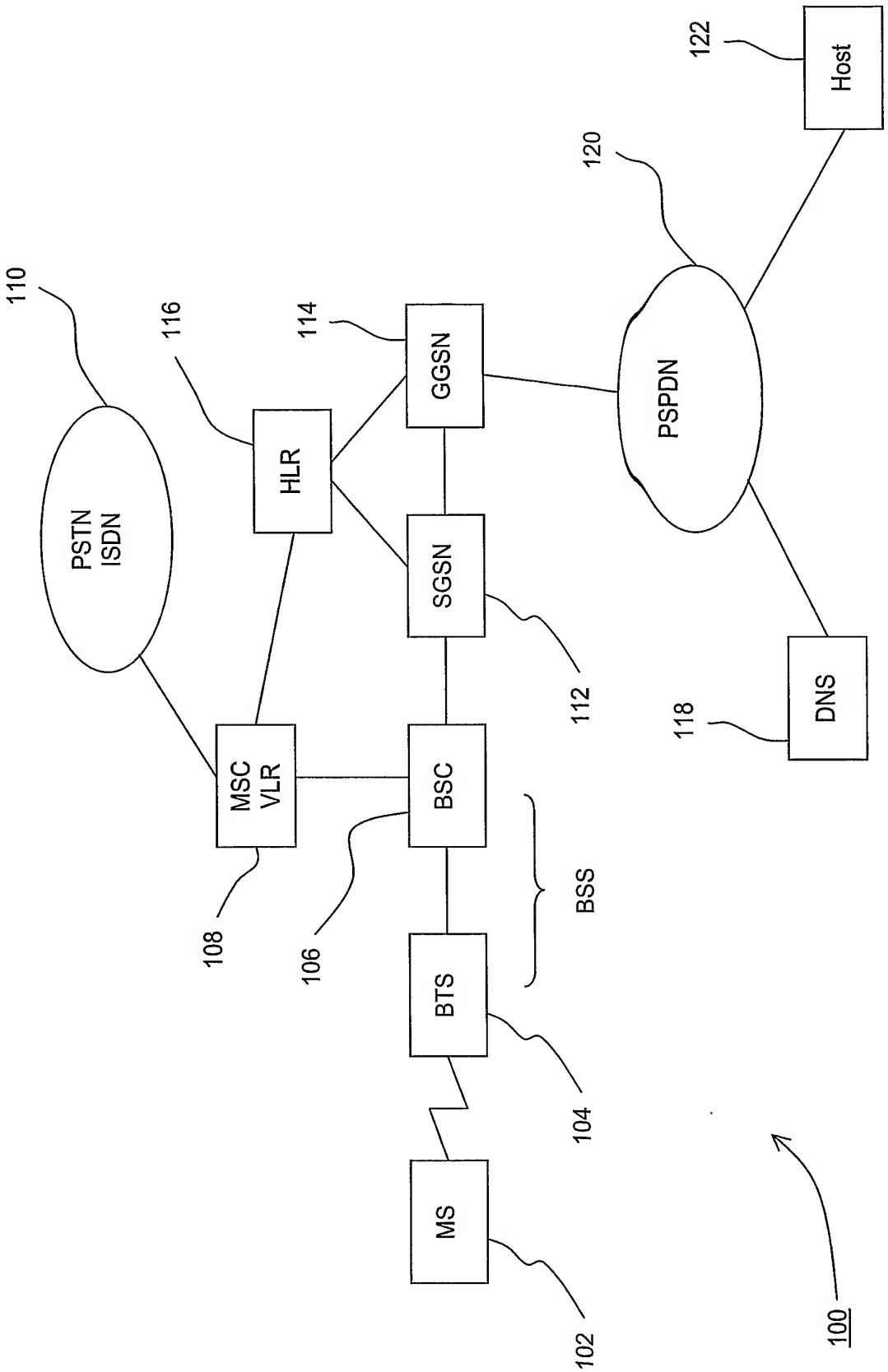

Host
122
120
PSPDN
110
PSTN
ISDN
116
HLR
114
GGSN
SGSN
112
MSC
VLR
BSC
108
106
BSS
BTS
104
MS
102
DNS
118
100

FIG. 7

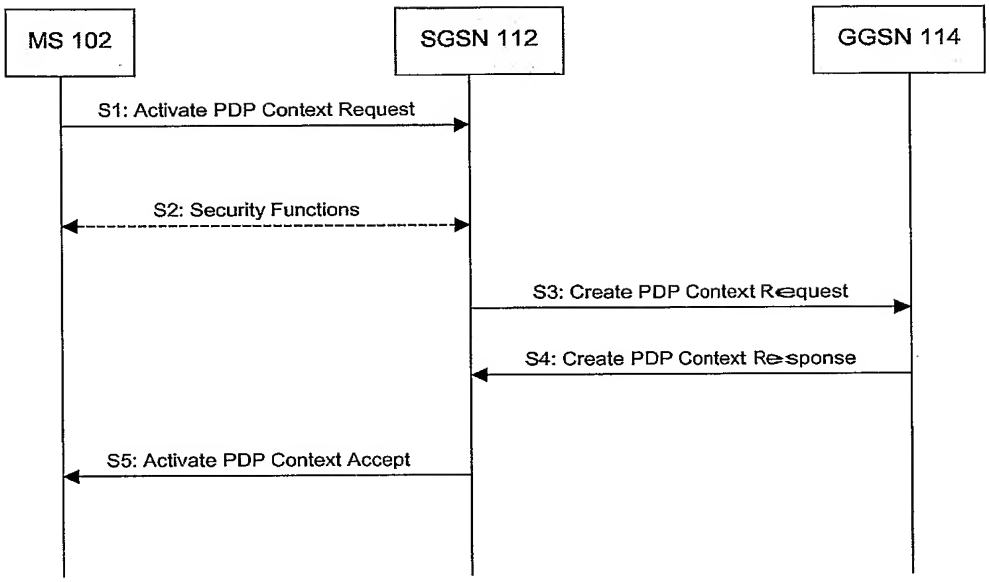

MS 102
SGSN 112
GGSN 114
S1: Activate PDP Context Request
S2: Security Functions
S3: Create PDP Context Request
S4: Create PDP Context Response
S5: Activate PDP Context Accept

FIG. 8

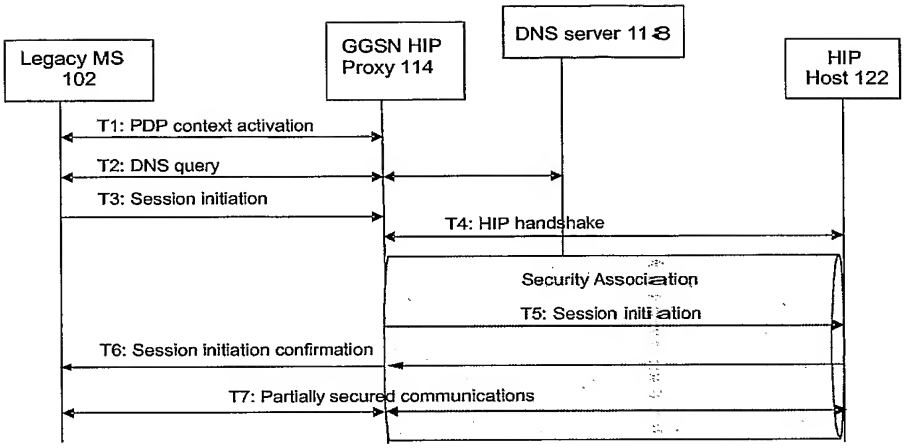

Legacy MS 102
GGSN HIP Proxy 114
DNS server 118
HIP Host 122
T1: PDP context activation
T2: DNS query
T3: Session initiation
T4: HIP handshake
Security Association
T5: Session initiation
T6: Session initiation confirmation
T7: Partially secured communications

FIG. 9

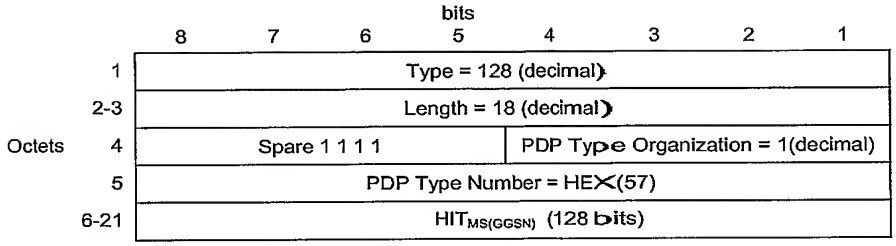

bits
8 7 6 5 4 3 2 1
Octets
1
Type = 128 (decimal)
2-3
Length = 18 (decimal)
4
Spare 1 1 1 1
PDP Type Organization = 1(decimal)
5
PDP Type Number = HEX(57)
6-21
HIT MS(GGSN) (128 bits)

FIG. 10

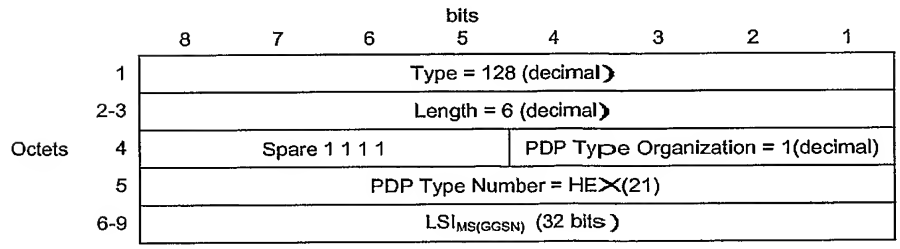
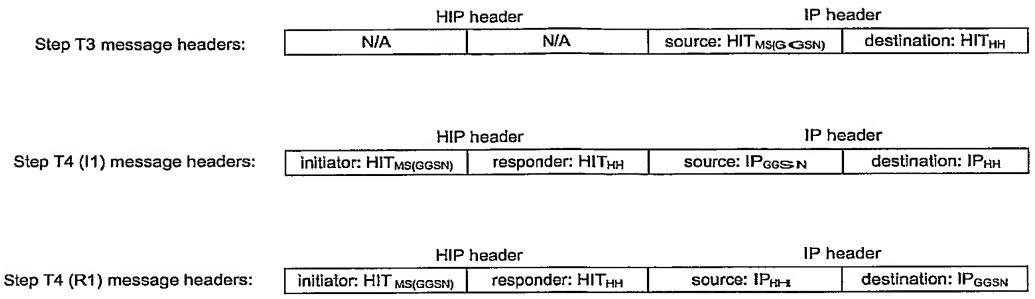

bits
8 7 6 5 4 3 2 1
Octets
1
Type = 128 (decimal)
2-3
Length = 6 (decimal)
4
Spare 1 1 1 1
PDP Type Organization = 1(decimal)
5
PDP Type Number = HEX(21)
6-9
LSI MS(GGSN) (32 bits)

FIG. 11


HIP header
IP header
Step T3 message headers:
N/A
N/A
source: HIT MS(GGSN)
destination: HIT HH
HIP header
IP header
Step T4 (I1) message headers:
initiator: HIT MS(GGSN)
responder: HIT HH
source: IP GGSN
destination: IP HH
HIP header
IP header
Step T4 (R1) message headers:
initiator: HIT MS(GGSN)
responder: HIT HH
source: IP HH
destination: IP GGSN

9/11

FIG. 12

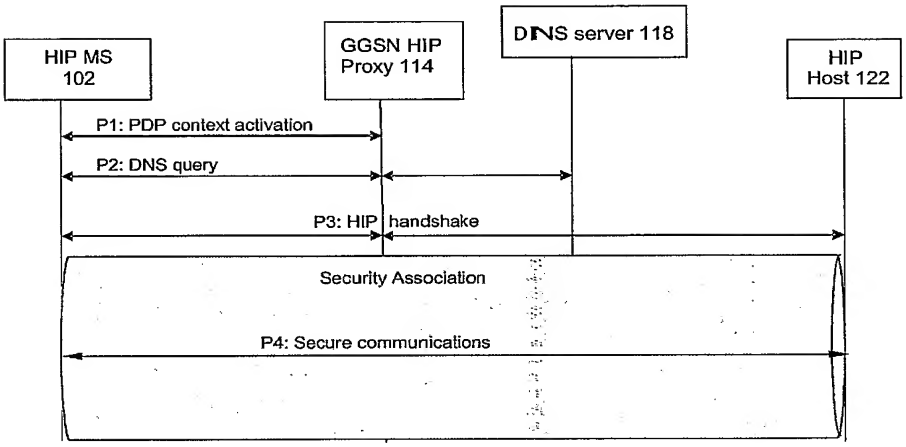
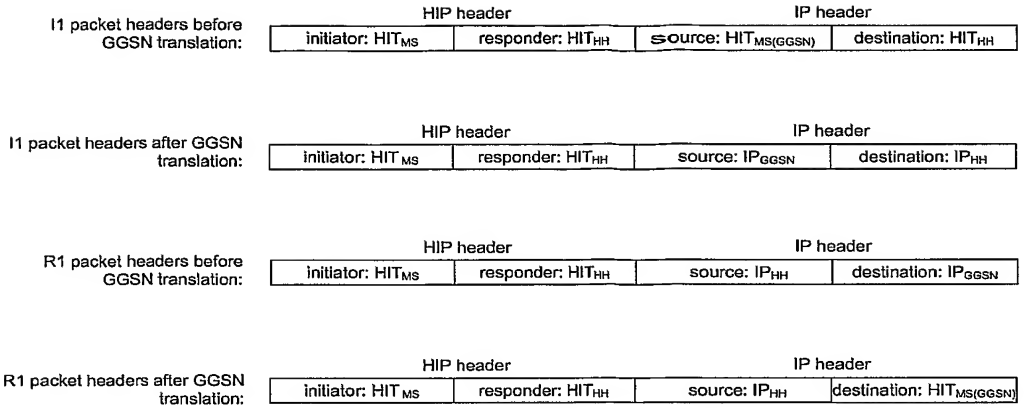

HIP MS
102
GGSN HIP
Proxy 114
DNS server 118
HIP
Host 122
P1: PDP context activation
P2: DNS query
P3: HIP handshake
Security Association
P4: Secure communications

FIG. 13


I1 packet headers before GGSN translation:
HIP header
IP header
initiator: HIT_MS
responder: HIT_HH
source: HIT_MS(GGSN)
destination: HIT_HH
I1 packet headers after GGSN translation:
HIP header
IP header
initiator: HIT_MS
responder: HIT_HH
source: IP_GGSN
destination: IP_HH
R1 packet headers before GGSN translation:
HIP header
IP header
initiator: HIT_MS
responder: HIT_HH
source: IP_HH
destination: IP_GGSN
R1 packet headers after GGSN translation:
HIP header
IP header
initiator: HIT_MS
responder: HIT_HH
source: IP_HH
destination: HIT_MS(GGSN)

11/11